A new enigmatic dimorphic *Lytta* from Crimea, Ukraine (Coleoptera: Meloidae)

Новый диморфный вид рода *Lytta* (Coleoptera: Meloidae) неясного родства из Крыма (Украина)

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Lytta zubovi **sp. nov.**, a new species of Meloidae from Crimea (Ukraine) is described and figured. The species is dimorphic, with the female, known only from a photograph, brachyelytrous and probably apterous. It is tentatively placed in the genus *Lytta* Fabricius, 1775, waiting for a revision of the tribe Lyttini. According to the present concept of *Lytta*, the new species is similar to the Holarctic subgenus *Poreospasta* Horn, 1868, never recorded from Europe, even though it is strictly different, particularly in the head and pronotum shape, and the dimorphic condition of wings.

Описан новый вид семейства Meloidae, *Lytta zubovi* **sp. nov.,** из Крыма (Украина). Вид характеризуется резким вторично-половым диморфизмом: у самки, известной только по фотографии, надкрылья укорочены, а крыльев, по-видимому, нет. Новый вид предварительно отнесен к роду *Lytta* Fabricius, 1775, требующему ревизии. *Lytta zubovi* **sp. nov.** сходен с видами голарктического подрода *Poreospasta* Horn, 1868, неизвестного из Европы, но резко отличается от них, в первую очередь, формой головы и переднеспинки, а также половым диморфизмом по признаку наличия крыльев.

Key words: Ukraine, Crimea, Coleoptera, Meloidae, *Lytta,* new species

Ключевые слова: Украина, Крым, Coleoptera, Meloidae, *Lytta,* новый вид

The beetle family Meloidae was recently studied phylogenetically, based on both morpho-biological characters of larvae and adults (Bologna & Pinto, 2001) and molecular characteristics (mtDNA 16S, nDNA ITS2) (Bologna et al., 2008). Both these studies suggest possible polyphyly of the tribe Lyttini, the most diverse group of the subfamily Meloinae, which includes some 31 genera. New molecular research is in progress on this tribe to clarify its monophyly and the relationships among genera, and new taxa have to be described (Bologna et al., unpublished).

In this paper we describe a new species from Crimea, which is tentatively placed in the genus *Lytta* Fabricius, 1775, but has several unusual morphological characters, in particular the exclusive dimorphic condition of the elytra and functional wings. As the monophyly of *Lytta* is still under discussion due to the extreme heterogeneity of its

subgenera (Selander, 1960; Kaszab, 1962; Bologna, 1991; Bologna & Pinto, 2002), the possible relationships of the new species are only briefly discussed.

Order **COLEOPTERA**

Family **MELOIDAE**

Genus ***Lytta*** Fabricius, 1775

***Lytta zubovi* sp. nov.**
(Figs 1–6)

Holotype. Male; Crimea, Arabatskaya Strelka, Arabatskaya Krepost' [Fortress], 29 Apr. 2008, coll. A. Zubov (Zoological Museum of the Moscow State University).

Paratype. Male, same data as holotype but deposited in M.A. Bologna's collection, University Roma Tre.

The type locality (coordinates: 45.295155° N 35.479005° E) lies in the southern portion of the striped isthmus Arabatskaja Strelka, which delimits eastward the Sivash Lagoon of the eastern Crimea (Ukraine). Beetles were collected on dry grasses. The surrounding area is covered with the steppe, here and there partly saline, near a coastal lake ('liman') in saline soil area.

Fig. 2. *Lytta zubovi* **sp. nov.** Ibid., close-up of head and pronotum (paratype)

Other material. We examined one photo (Fig. 6) of two additional specimens, one male and one female copulating, made by V.V. Savchuk in Crimea near the Petrovski Village, Peschanaya Ravine, about 5 km north-east from Feodosia, on April 25, 2005. Obviously, these specimens are not designated as paratypes, but a few features of the female were inferred from this photo showing a pair of the new species in the "linear phase" of copula (Pinto & Selander, 1970), typical of the subfamily Meloinae (see Bologna, 1991, for a review of sexual behaviour). The locality of the pho-

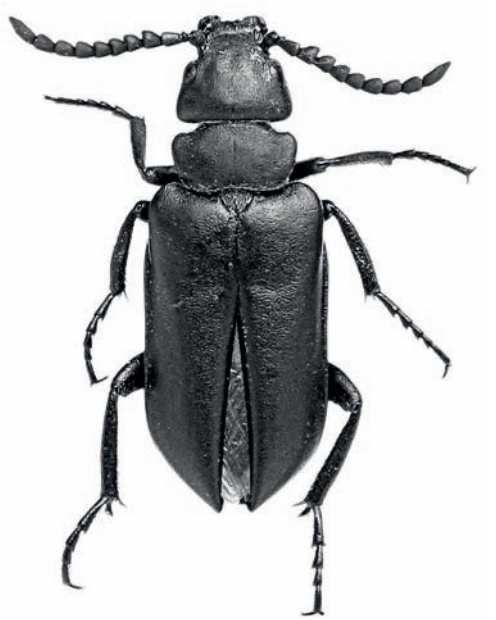
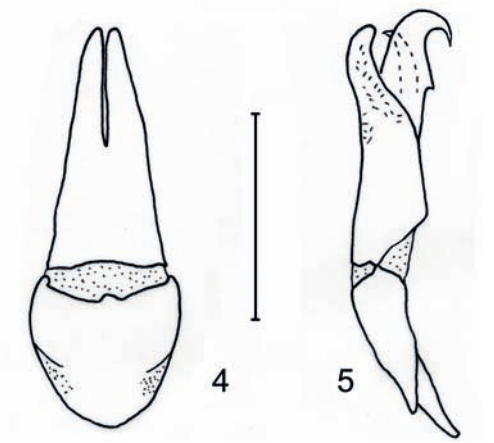


Fig. 1. *Lytta zubovi* **sp. nov.** Male habitus in dorsal view (holotype).

Fig. 3. *Lytta zubovi* **sp. nov.** Male habitus in ventral view (holotype)



Figs 4, 5. *Lytta zubovi* **sp. nov. 4**, male genitalia in dorsal view (paratype); **5**, male genitalia in lateral view (paratype).

tographed specimens is a virgin land steppe about 29 km south of the type locality, on the southern side of the Arabatskaja Strelka isthmus.

Diagnosis. A middle-sized *Lytta* (maximal length 12 mm; according to the Fig. 6, possibly the female is larger), with the body dorsally alutaceous, from dark blue to almost black with a tint of bluish, but antennae black. Head subtrapezoidal, with only occiput slightly convex; frons without distinctly pronounced furrows; labrum not deeply emarginate; middle antennomeres not incrassate. Pronotum very short, shorter and wider than head, subtrapezoidal, rather flat, anteriorly wider than at base, fringed with white or yellowish elongate setae on fore and basal margins. Forefemora with anterior surface not concave; pro-, meso- and metatibiae with two spurs (those on metatibia strongly different in size and shape); hind trochanters not spined. Elytra, at least partly, distinctly flattened. Male: elytra almost completely covering abdomen, metathoracic wings regularly developed; gonostyli with very small and smooth apical hook, short setae and apical lobes; aedeagus with sharply different hooks, distal one great and strongly curved, proximal one very short, oblique. Female: elytra short, incompletely covering anterior half of abdomen, metathoracic wings possibly lacking or vestigial.

Description (primarily based on the two male types, with a few female characters inferred from the photo on Fig. 6). Body length from apex of mandibles to elytral apex 10.9–12 mm (possibly larger in female, which could be ca. 1.5 times as long as male, Fig. 6). Body alutaceous, dorsal surface from dark blue to almost black with bluish sheen, ventral surface (including more or less shining legs) dark blue, antennae black, antennomeres I and II weakly shining, III–XI submatte and slightly shagreened. Body setation rufous or brownish, but from almost white to yellow on fore and posterior margins of pronotum, longer on labrum, clypeus, frons, pronotum and ventrally, more robust and darker on legs; elytra almost nude, with scattered microsetae only.

Head (Fig. 2) short and very wide posteriorly, subtrapezoidal, widest near posterior margins of temples; dorsal surface almost flat, slightly depressed just behind middle, occiput slightly convex; with somewhat sparse, rather dual punctation, with larger shallow punctures interspersed with quite small ones; highest concentration of larger punctures around antennal bases and to some extent on temples; interspaces between punctures shagreened; frons without distinct furrows; width of frons between eyes equal to 1.7 eye width; temples strongly developed, visibly longer than eyes; eyes only slightly convex and protruding beyond head outline, in lateral view their posterior margins straight, oblique; their antero-dorsal margin only scarcely emarginate; fronto-clypeal suture deep. Clypeus transverse, suboval, densely punctate, with surface subrugose. Labrum transverse, subtrapezoidal, widest at anterior angles; punctures on labrum deep, large, less evenly distributed than on clypeus. Mandibles robust, short, rather weakly protruding from under labrum, with blunted apices. Maxillary palpi short, palpomeres more or less cylindrical, with apical palpomere considerably longer than wide, not widened toward apex, weakly rounded apically. Labial palpi short. Mala in ventral view triangularly nar-

Fig. 6. *Lytta zubovi* **sp. nov.** male and female copulating in nature (Crimea, near Feodosia, see text).

rowed in front. Genae almost flat. Antennae (Fig. 3) with 11 antennomeres, reaching end of basal quarter of elytra when directed posteriorly; antennomere I rather weakly widened, about 2.6–2.8 times as long as II; II very short, slightly wrinkled, transverse; III clearly longitudinal, symmetrical, slightly subtrapezoidal, about as long as IV; IV–VIII asymmetrical, more or less triangularly widened, progressively narrowing toward antennal apex; antennomere IV slightly longer than any of antennomeres V–VIII; IX and X slightly widened, IX subequal in length to VIII, X slightly longer than IX; XI about 1.8–1.9 times as long as X, and about 2.5 times as long as wide, subcylindrical in basal half and conically narrowed in apical half; setae on antennomeres I and II black and longer, very short, denser and recumbent on antennomeres III–XI.

Pronotum (Figs 1, 2) very short, strongly transverse (about 1.8 times as wide as long), subtrapezoidal, 0.8 times as long as head (including clypeus), wider anteriorly than at base, and wider than temples. Surface distinctly flattened, vaguely depressed in anterolateral parts and in middle of base, with vague median line; base of pronotum with edging and with distinct sinuosity medially. Prosternum (Fig. 4) wide and very short, especially in front of coxae, where it is considerably shorter than procoxal cavity, convex at posterior apex. Mesosternum wide and short, mesepisterna with a wide depressed area at anterior margin, narrowly meeting at midline. Metasternum wide and long (possibly shorter in the apterous female), with rather large punctures. Metepisterna wide, rather coarsely transversely rugose. Pro-, meso- and metatibiae with two spurs, fore and middle spurs both slender and acuminate, inner metatibial spur spoon-shaped, about half as long as mesotarsomere I, outer spur slender and pointed. Profemora not concave; protibiae almost straight, mesotibiae slightly outcurved, metatibiae almost straight; pro-, meso- and metatarsi not widened, foretarsi with scarce ventral pad of short setae; metatrochanters not spined. Metatarsomere I twice as long as metatarsomere II and apical metatarsomere, claws smooth, membra-

nous appendages similar to claws in size and shape. Scutellum transverse, with rounded posterior margin, strongly and densely punctate, covered with elongate yellowish hairs. Male elytra more or less elongate and parallel-sided, covering abdomen almost completely, 1.4 times as wide as pronotum and 1.85 times as long as wide, with distinct shoulders and rounded apices; lateral edging distinctly raised; surface of elytra distinctly finely alutaceous, with moderately dense, small confused punctures, in anterior half of elytra partly confluent and forming transverse wrinkles. Epipleura lacking in posterior third of elytra. Female elytra short, covering somewhat less than anterior half of abdomen (Fig. 6), metathoracic wings probably lacking or vestigial.

Posterior margins of visible abdominal sternites almost straight, penultimate sternite evidently sinuously emarginate in middle, apical sternite widely and deeply V-shaped emarginate in the middle (probably with rounded posterior margin in female). Surface of sternites distinctly shagreened and with rather dense, relatively large punctures. Male: gonostyli in dorsal view as in Fig. 4, with apical lobes approached, slightly convergent apically; in lateral view as in Fig. 5, with apical lobes narrowed in front, with scattered short setae; in ventral view with two very small and smooth apical hooks. Aedeagus in lateral view as in Fig. 5, with very large and strongly curved distal hook, proximal hook extremely short and oblique; endophallic hook acuminate, slender apically.

Etymology. The new species is named after A.S. Zubov, a Moldavian student interested in beetles, a collector of the new species.

DISCUSSION

Lytta zubovi **sp. nov.** is an enigmatic species, the only dimorphic one in the genus *Lytta*, and the second species with at least one sex wingless. One North American species, *Lytta* (*Poreospasta*) *sublaevis* (Horn, 1868) from California, is brachyelytrous and apterous in both sexes, even if male has elytra longer than in female (Selander, 1960).

As discussed by Bologna (1991), Pinto & Bologna (1999) and Bologna & Pinto (2002), some genera of the family Meloidae have reduced elytra and metathoracic wings as in the well know genus *Meloe* Linnaeus, 1758. A few genera of the subfamilies Nemognathinae and Meloinae are dimorphic, with elytra and wings reduced only in female. As concerns Meloinae, several genera belonging to different tribes have these features in all or in some species, such as *Berberomeloe* Bologna, 1989, *Cordylospasta* G. Horn, 1875, *Cysteodemus* LeConte, 1851, some *Epicauta* Redtenbacher, 1845, *Megetra* LeConte, 1859, *Trichomeloe* Reitter, 1911, *Parameloe* Denier, 1933, *Physomeloe* Reitter, 1911, one *Phodaga* LeConte, 1858, one *Picnoseus* Solier, 1851, *Pseudomeloe* Fairmaire et Germain, 1863. This character arising as a parallelism was misinterpreted as a synapomorphy, and some species of these genera were described as *Meloe*. Actually this genus is distinct from other Meloinae by the position of spiracles and the phoretic adaptation of the first instar larva (Bologna & Pinto, 2001). Adults are wingless and brachyelytrous in both sexes and the head is lacking a red spot; this macula being present in the other two Palaearctic genera (*Berberomeloe* and *Trichomeloe*, tribe Lyttini), and lacks in *Physomeloe* (tribe Meloini), which has the pronotum with two pairs of red tubercles.

The female of *L. zubovi* **sp. nov.** closely resembles the genus *Meloe*, particularly the subgenus *Micromeloe* Reitter, 1911, due to the flattened head, pronotum and elytra (see Bologna, 2008, for the checklist of the species belonging to this subgenus). Actually, the winged male, the shape of mesosternum and male gonostyli, slightly convergent at apex, as well as the shape of aedeagal hooks, distinguish the new species from all *Meloe*. We considered the possibility that *Lytta zubovi* **sp. nov.** could have been erroneously described in the past as a *Meloe*, based on female specimens, but none Palae-

arctic species, particularly from Ukraine, southern Russia, Caucasus or Kazakhstan, corresponds to *L. zubovi* **sp. nov.**, particularly because of its characteristic and unique shape of pronotum, widened in the anterior half. The only comprehensive checklist of the Crimean Meloidae was published by Levtshinskaja (1964), who recorded 12 species of *Meloe*, including *Meloe* (*Micromeloe*) *uralensis* Pallas, 1773, a species superficially similar to the female of *L. zubovi* **sp. nov.**, but immediately distinguishable by the shape of antennomeres, pronotum, elytra, etc.

According to the more recent literature (Selander, 1960; Kaszab, 1962; Bologna & Pinto, 2002), the genus *Lytta* could be subdivided into 9 subgenera: (i) *Adicolytta* Selander, 1960, from North and Central America; (ii) *Asiolytta* Kaszab, 1962, from Middle and Central Asia; (iii) *Indiolytta* Selander, 1960, from the Indian subcontinent, considered a synonym of *Eolydus* Denier, 1913 by Kaszab (1962), and resurrected as subgenus of *Lytta* by Bologna & Pinto (2002); (iv) *Lytta* Fabricius, 1775, from Eurasia; (v) *Mesolytta* Selander, 1960, from Middle Asia and the easternmost portion of West Asia; (vi) *Paralytta* Selander, 1960, from North and Central America; (vii) *Pomphopoea* LeConte, 1862, from eastern North America, considered a distinct genus by some authors in the past; (viii) *Poreospasta* Horn, 1868, from North America and Asia, in the past considered a distinct genus by some authors; (ix) *Pseudolytta* Selander, 1960, from Southeast Asia. *Syriolytta* Kaszab, 1962, described as a subgenus of *Lytta*, was promoted to genus by Bologna & Pinto (2002), who briefly discussed some diagnostic characters of *Lytta* and defined its strictly Holarctic distribution.

According to Pinto & Bologna (1999) and Bologna & Pinto (2002), the limits of the genus *Lytta* are yet to be resolved; these authors have shown this genus to be a depositary for generalised meloine species. It is difficult to place the new Crimean species in any of the described subgenera, and its generic position needs confirmation after a cladistic revision using both morphological and molecular characters.

We compared the new species with most species of American and Eurasian *Lytta*, as well as with all other described lyttine genera. As concerns in particular the genus *Lytta,* due to the presence of labrum not deeply emarginate, male intermediate antennomeres not incrassate, two foretibial spurs, male foretarsi not modified, and forefemora not concave, the new species is similar to the species of the subgenus *Poreospasta*. Actually, the shape of head, flattened and strongly widened posteriorly, that of pronotum, more or less flattened, wider anteriorly but not angulate, and the elytra at least more or less flattened, are all unique features of *L. zubovi* **sp. nov.** differentiating it from all North American and Asiatic species of *Poreospasta*. The colouration of the new species is also unique among the Palaearctic *Lytta*. *Lytta zubovi* **sp. nov.**, particularly the female, resembles superficially *L.* (*P.*) *sublaevis*.

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